REMARKS

Amendments to Claims 1 and 12

Claims 1 and 12 are amended to clearly indicate that the purge process is performed at ambient temperature or up to 80°C. Support for these conditions is provided in the Examples, see also paragraph **[0056]**, Table 2. Under these conditions, the AMC does not decompose. Claim 27 has been added and is directed to removal of airborne molecular contaminants (AMC) from a wafer where the purge process is performed under conditions that do not change the AMC. No new matter has been added.

Rejection Under 35 U.S.C. §112, Second Paragraph

Claims 1-5, 8-15, and 18-26 are being rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Both claims were previously amended to add the phrase "the contaminated purge gas including AMC from the substrate." The amendment makes clear that the step of "producing a contaminated purge gas by transferring AMC from the substrate into the purified purge gas" results in having AMC from the substrate present in the contaminated purge gas. Support for this amendment is found in the numerous examples of the application utilizing FIG. 4, and in particular paragraph **[0044]**. Further, the language is made particularly clear in view of the conditions for the purge process, now set forth in the claims. As stated above, under these conditions the AMCs do not undergo degradation.

Patentability of Claim 1 and 12 over Somekh and Van Schaik

Independent Claim 1 presently stands rejected under 35 U.S.C. §102(e) as being anticipated by Somekh (U.S. Patent No. 6,427,703). Independent Claim 12 presently stands rejected under 35 U.S.C. §103(a) as being obvious in view of Somekh and Van Schaik et al. (U.S. Patent No. 6,724,460). Both Claims, however, are patentable over Somekh and Van Schaik for three independent reasons: (i) neither reference teaches "transferring AMC from the substrate into the purified purge gas, the contaminated purge gas including AMC from the substrate;" (ii) neither reference teaches providing a purified purge gas "having an AMC concentration of less than 1 part per billion (ppb) on a volume basis"; and (iii) neither reference teaches conditions which maintain the integrity of the AMC, *i.e.,* the AMC is not decomposed.

a. Somekh and Van Schaik teach transforming an AMC, not transferring an AMC, from a substrate

Both Claims 1 and 12 recite the step of "producing a contaminated purge gas by *transferring* AMC from the substrate into the purified purge gas" (emphasis added). The claims have been further amended to indicate that the purge takes place at ambient conditions or up to 80°C. These conditions are not suitable for AMC removal by chemical decomposition and thus the AMC is not "transformed" but rather transferred. Somekh and Van Schaik do not provide any such teaching because the purge gases used in the cited art react with the contaminants on the surface to change their chemical disposition before the reacted contaminants are removed from the surface. Both the Somekh and Van Schaik processes require high energy, such as thermal activation, microwave activation, plasma discharge, ozone activation (see Col. 6, lines 38- 45 of Somekh) and UV activation (Van Schaik). Therefore, the purge gas in Somekh and Van Schaik is not "*transferring* AMC from the substrate into the purified purge gas." Rather the contaminants on the surfaces of the cited art are *transformed* into a different chemical entity that is subsequently removed.

Somekh states very clearly that the oxidizer gas transforms contaminants, such as carbon residue and hydrocarbon gas, into an oxidized carbon gas that is subsequently evacuated.

> . . . the oxidizer that is introduced into the imaging chamber from the oxidizer source acts to oxidize *any* carbon contaminants that may be present within the chamber. Thus, any carbon residue or deposits on the mask and walls of the chamber, and on any other surface within the chamber is oxidized. The oxidation process transforms *any* carbon residue that is in solid form to a gaseous form. Likewise, *any* hydrocarbon gas that is present in the imaging chamber is oxidized by the oxidizer that is supplied by the oxidizer source. The oxidization process thus creates an oxidized carbon gas within the imaging chamber. Such a gas may be produced in the form of carbon monoxide (CO) or carbon dioxide (CO_2), or other volatile carbon-oxygen compounds. The oxidized carbon gas is a volatile gas species that can be evacuated from the imaging chamber to thereby remove

> the oxidized carbon contaminants. (see Somekh, column 8, line 58 to column 9, line 7; emphasis added)

Van Schaik specifically recognizes that oxygen-containing species

> . . . themselves are not effective as cleaning agents, [therefore] they are used in combination with UV radiation. The UV radiation cracks the oxygen-containing species to produce atomic oxygen or other oxygen containing radicals (see Van Schaik, column 4, lines 15-19).

Van Schaik further notes in discussing the mechanism of cleaning that radicals react with contaminants on the surface (see column 7, lines 38-57). Thus, Van Schaik specifically teaches away from "transferring AMC from the substrate into the purified purge gas" because it suggests the only way for oxygen-containing species to clean a surface is creating high energy radicals that chemically attack the contaminants.

This distinction between Somekh and Claim 1 was presented in the Applicants' amendment of November 22, 2004. In particular, it was stated that

> The method [of Claim 1] also "transfer[s] the AMC from the substrate into the purified purge gas." Somekh, in contradistinction, has a surface contaminated with carbon deposits before the oxidizer is introduced. The surface is not originally contaminated with the gas that is eventually removed. Somekh does not teach the element of Claim 1. (see Applicants' Amendment of November 22, 2004 at page 10)

In view of these remarks, Claims 1 and 12 are patentable because the cited art fails to teach the recited elements of the Claims. Since all other pending claims ultimately depend from either Claim 1 or 12, the other claims are also patentable for substantially the same reasons.

b. "Pure oxygen gas" does not mean a gas with zero contaminants to one of ordinary skill in the art

Claims 1 and 12 recite that the purified purge gas has "an AMC concentration less than about 1 part per billion (ppb) on a volume basis." The final office action, and during the interview with the Examiner, it has been repeated that Somekh teaches this element of the

Claims. In particular, Somekh refers to the use of "pure oxygen gas." The Examiner contends that "pure oxygen gas" means a gas having zero AMC concentration. One of ordinary skill in the art reading Somekh, however, would not believe "pure oxygen gas" means zero AMC concentration in the gas.

As the Court of Appeals for the Federal Circuit has held, "[i]t is well settled that a prior art reference is relevant for all that it teaches *to those of ordinary skill in the art*" (see In re Fritch, 972 F.2d 1260, 1264 (Fed. Cir. 1992), emphasis added). Thus, the appropriate inquiry here is whether the phrase "pure oxygen gas" in Somekh would teach one of ordinary skill in the art that what is meant is a gas having zero AMC concentration.

As stated by Dr. Daniel Alvarez, Jr. during the interview with the Examiner, and as set forth in an appended declaration under 37 C.F.R. §1.132 (unexecuted, executed copy will be submitted shortly), one of ordinary skill in the art would not interpret the phrase "pure oxygen gas" in Somekh to mean a gas having zero AMC concentration. The declaration sets forth various exhibits from industrial providers of "pure" gases for the chemical and electronic industries. Each exhibit shows that "pure" oxygen gases, in fact, contain some level of contaminants. Indeed, of the exhibits provided, even the oxygen gas with the leanest amount of contaminants has as much as 100 parts per billion. Thus, the phrase "pure oxygen gas" is not recognized as meaning an oxygen gas having zero AMC concentration.

Rejections which rely upon Somekh and optionally Van Schaik

The claims are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh in view of Alvarez Jr., *et al.* or Spiegelman *et al.*, or Alvarez Jr., *et al.* in view of Van Schaik.

None of the combinations of prior art renders obvious Applicants' claimed invention. All rejections rely upon Somekh as the primary reference. Somekh has been addressed in detail above and the claims have been distinguished over the purge conditions taught by Somekh. The teachings of the secondary references do not contribute anything further to the Somekh teachings and therefore do not render the claims obvious. Withdrawal and reconsideration of these rejections are respectfully requested.

Double Patenting

The Office Action maintains that Claims 1-5, 8-11, 12-15, 18-19, 21 and 23 of the present application are provisionally rejected under the judicially created doctrine of obviousness-type double patenting in light of particular claims of U.S. Application No. 10/683,904 (now US Patent No. 6,913,654) and either Somekh or Van Schaik. The claims are not obvious, however, because the suggested combinations do not teach or suggest the pending claims of the present application.

As discussed above, Somekh and Van Schaik provide no teaching or suggestion that a purge gas comprising oxygen and having an AMC concentration less than 1 ppb can be used to produce a contaminated purge gas by *transferring* AMC from the substrate into the purified purge gas, the contaminated purge gas including AMC from the substrate. Thus, combining either reference with any of the claims of U.S. Application No. 10/683,904 does not suggest that a purge gas comprising oxygen may be used by the methods recited in the pending claims. Although the claims of U.S. Application No. 10/683,904 include the step of "producing a contaminated purge gas by transferring AMC from the substrate into the purified purge gas," the purified purge gas comprises water at a concentration of at least about 100 ppm. No suggestion or teaching exists pointing to the use of a purge gas comprising oxygen that meets all the recitals of Claims 1 and 12. The claims of U.S. Application No. 10/683,904 combined with either Somekh or Van Schaik in no way suggest the full scope of Claim 1 or 12 of the present application.

The Office Action maintains that Claims 1-5 and 8-11 of the pending application are not patentably distinct from the claims of U.S. Application No. 10/683,904 in view of either Alvarez Jr, *et al.* (6,391,090) or Spiegelman (6,638,341). The patentability of a claim, however, is not negated because some elements of the claim are taught by the copending application. Indeed, the *entire* claim must be obvious in light of the cited art to render a claim unpatentable. Since the elements of "transferring AMC from the substrate into the purified purge gas, the contaminated purge gas including AMC from the substrate," where the purified purge gas comprises oxygen, are not taught by the citations, the pending claims are not obvious. Alvarez teaches a unique combination of materials for purifying lens gases, but does not teach or suggest use of the purified gases in the present purge process nor does the reference teach removing contaminants from substrates that are already contaminated. Spiegelman teach use of pressurize and vent cycle(s) to prepare substrates for gas purification processes, but does not teach use of purge gases comprising oxygen and having an AMC concentration less than about 1 ppb. Further, the Spiegelman reference does not use an inlet and an outlet for the pressure/vent cycles and thus there is not net flow of gas, as is provided in the present application. For all these reasons, the pending claims are patentably distinct from the claims of U.S. Application No. 10/683,904 in view of Alvarez Jr, *et al.* or Spiegelman.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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